Space Weather Forecast

Issued on Friday, 22 April 2022 at 01:14 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance Strong flares (R3 Radio Blackouts), with further Moderate flares (R1/R2 Radio Blackouts) likely.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is currently Moderate due to one Moderate-flare observed in the last 24 hours, just below the level of being classed a Strong flare. This occurred early in the UTC day on the 21st from the northernmost sunspot group in the large complex area of sunspots in the northeast approaching the centre disc. There are a number of other smaller sunspots on the disc, however these are all smaller and less active at present. A Coronal Mass Ejection (CME) was released from the Moderate flare. This appears to be a weak CME, with a glancing arrival possible late on the 24th.

Solar Wind / Geomagnetic Activity: The solar wind speed has been slightly elevated starting the period at around 400km/s, but increasing to around 470km/s.The Interplanetary Magnetic Field carried by this wind largely weak throughout. However a small enhancement to Moderate levels was observed after 21/1100 UTC, with the important north-south component of the field also becoming negative (southward pointed). Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be Moderate over the next four days, with a chance of Strong flares, mainly from the large and fairly complex regions currently in the northeast quadrant of the Sun. There is on ongoing likelihood of Moderate flares.

Solar Wind / Geomagnetic Activity: The CME from the Moderate flare on the 21st has the potential to glance Earth on the 23th (Day 3). Solar winds are expected to be at slightly elevated speeds on Day 1 (22nd) due to the influence of a coronal hole. Winds should then ease to background levels again on Day 2 or 3 (23rd or 24th) ahead of the next possible coronal hole enhancement on Day 3 or 4 (24th or 25th). Geomagnetic activity is likely to be Quiet with isolated Unsettled intervals, and a slight chance of Active intervals each day. Activity probably increasing to Unsettled to Active on Day 3 or perhaps Day 4 (25th) with a chance of G1/Minor storms due to the arrival of the high-speed stream of the coronal hole and/or any CME glance that occurs, although this carries low-moderate confidence.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to remain at background with no solar radiation storms occurring. However the risk of solar radiation storms, whilst remaining very low, will increase as the complex sunspot regions on the earth-facing disc move westwards through the period into a greater risk region for affecting the Earth should they produce any particle rich flares.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	30	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	70	70
Very Active	R3 to R5 X	No	20	20	20	20

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	7	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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